

REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Claims 1-29 are now pending, claims 1, 12, and 19 being independent. Dependent claims 24-29 have been added in this Reply.

In response to the Examiner's indication that the original title is not sufficiently descriptive, Applicants have amended the title of the invention to read --LOAD-OFF TRANSIENT ACCELERATION GENERATOR CONTROL APPARATUS/METHOD-- to be more clearly indicative of the invention to which the claims are directed. Applicants respectfully request that the Examiner approve the amended title, which is consistent with the title suggested by the Examiner on page 2 of the Office Action.

Prior Art Rejections

1. § 102 Rejection: Syverson

Claims 1-11 and 19-23 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by *Syverson et al.* (U.S. Patent 5,502,368). This rejection is respectfully traversed.

Independent claim 1 is directed to a generator control apparatus for supplying field current to a power generator. The generator control apparatus of claim 1 comprises: a field current modulator that repeatedly switches between an ON state and an OFF state to control a flow of field current to the power generator; a free-wheeling path that, when the field current modulator is in the OFF state, feeds excitation current received from the generator back to the power generator as a field current component; and an impedance circuit that selectively and temporarily absorbs excitation current in the free-wheeling path when the field current modulator is in the OFF state to reduce voltage overshoot in the

power generator upon occurrence of an operating transition. Thus, according to the present invention defined by claim 1, an impedance circuit selectively and temporarily absorbs excitation current in a free-wheeling path, which, when the claimed field current modulator is in the OFF state, feeds excitation current received from the generator back to the power generator as a field current component. As described for example on page 8 of the Disclosure with reference to Figs. 4A-4B, the claimed arrangement significantly accelerates decay of field current to contain voltage overshoot (see e.g., waveform (d) of Fig. 4B).

Syverson discloses a hybrid alternator, which, with reference to Fig. 1, includes a stator 10 and a rotor 20. The stator 10 includes a three phase stator winding 16. The rotor 20 includes a wound field rotor portion 24 for rotating within a first stator region 12 and a permanent magnet rotor portion 38 for rotating within a second stator region 14. The arrangement disclosed by *Syverson* operates in accordance with three voltage regulation states, achieved using the voltage regulator design illustrated in Figs. 12 and 13. More specifically, the voltage regulator operates in the following three states: (1) forward polarity ("boost") mode; (2) reverse polarity ("buck") mode; and (3) decay mode. As described for example at col. 15, lines 38-60, the voltage regulator operates in the forward polarity mode to start the flow of a forward current in a rotor winding 400 or for increasing an existing forward current flow, operates in the reverse polarity mode to start a reverse current flow or increase the magnitude of the reverse current flow, and operates in the decay mode to allow induced current from either the forward polarity mode or the reverse polarity mode to circulate through the rotor winding 400 and decay toward zero.

The disclosed embodiment of *Syverson* selectively activates the above-mentioned three states of operation using a full bridge of switches 408-412. For ease of illustration,

Applicants have provided Figs. A-C below to illustrate the operation of switches 408-412 for each of the three operating modes (the reference numerals corresponding to those used in *Syverson*).

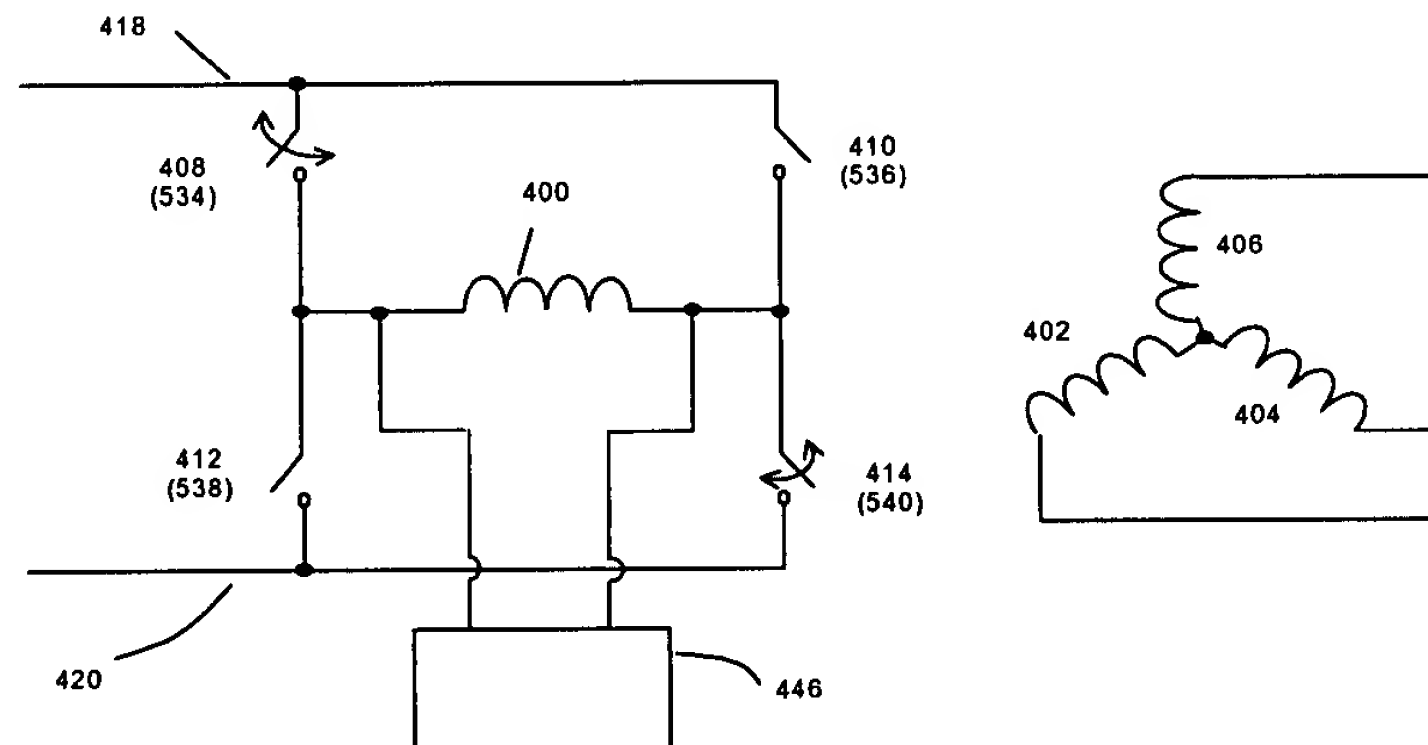


Figure A: Forward polarity mode excitation

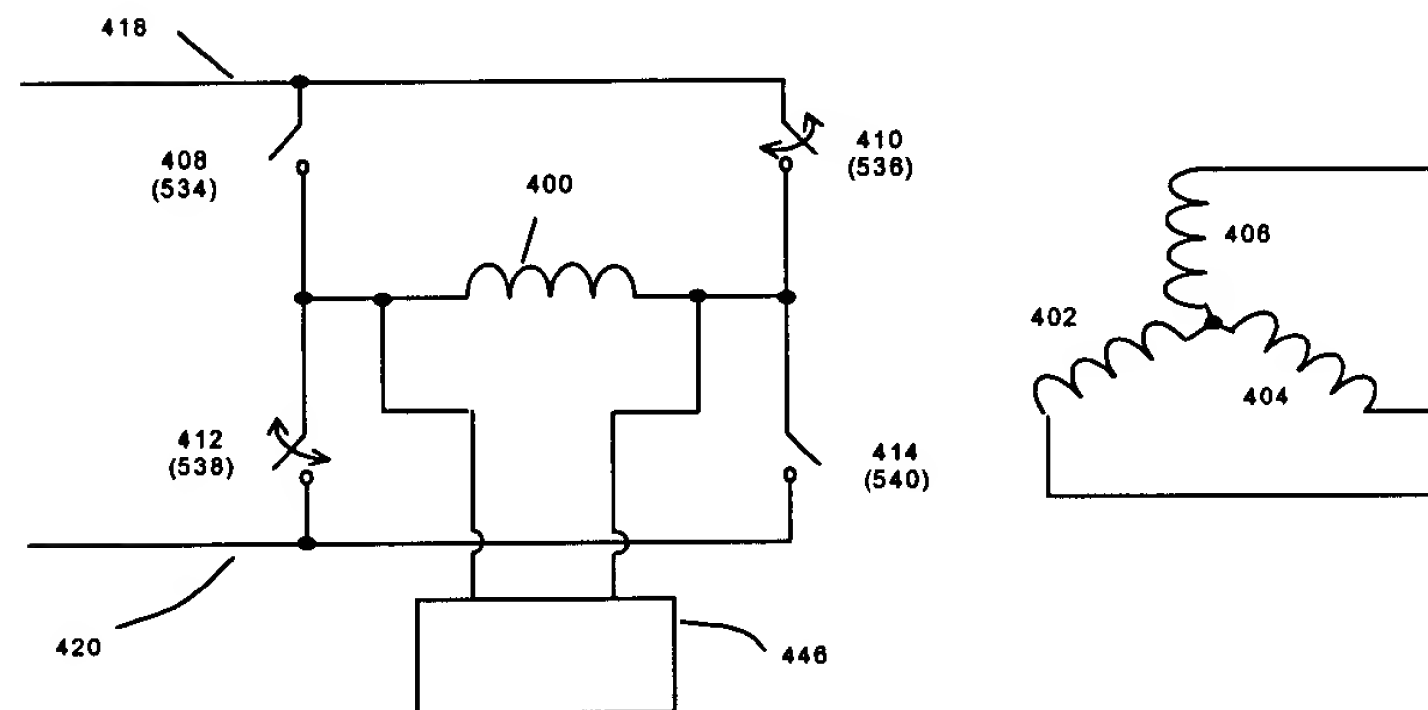


Figure B: Reverse polarity mode excitation

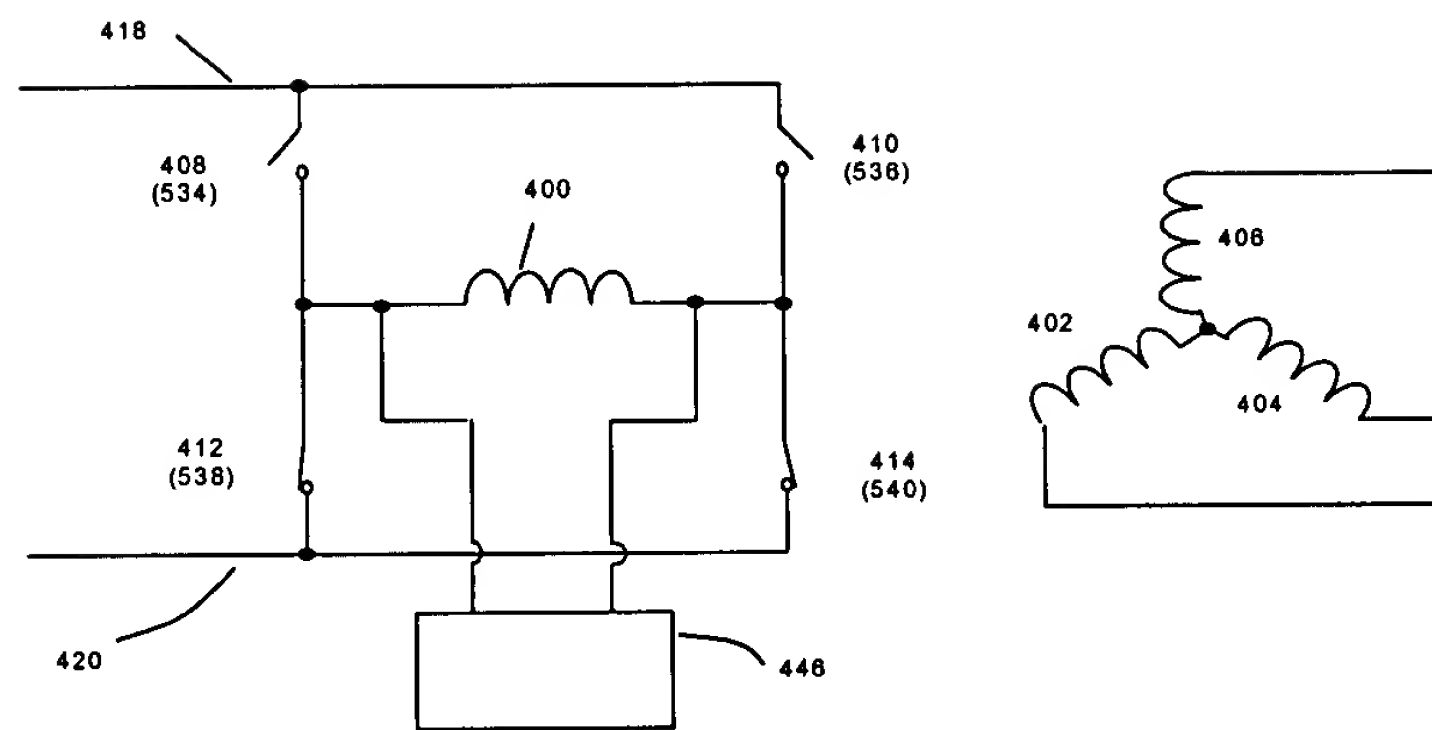


Figure C: Decay mode operation

In the forward polarity mode, switches 410 and 412 are turned OFF and switches 408 and 414 are turned ON and OFF to maintain a desired level of excitation current. In the reverse polarity mode, switches 408 and 414 are turned OFF completely and switches 410 and 412 are turned ON and OFF to maintain the desired level of excitation. In the decay mode, either switches 408 and 410 or 412 and 414 are turned ON to create a path which allows the residual excitation current to decay during the transition between forward and reverse polarity modes. Element 446 monitors the decay current. See col. 16, lines 5-21, 58-60.

In rejecting independent claim 1, the Examiner generally refers to Fig. 13 of *Syverson* as allegedly showing the free-wheeling path of the claimed invention and refers to Fig. 4 of *Syverson* as allegedly teaching the claimed impedance circuit. Applicants note, however, that *Syverson* fails to disclose an arrangement in which an impedance circuit is provided to selectively and temporarily absorb excitation in a free-wheeling path which, when a field current modulator is in an OFF state, feeds excitation current received from a generator back to the power generator as a field current component. Even in the decay

mode (illustrated in Figure C above), *Syverson* does not selectively and temporarily introduce an energy absorbing component in the field winding loop. If this rejection is maintained, Applicants respectfully request that the Examiner specifically identify how the teachings of *Syverson* are being applied to the specifically claimed features of claim 1.

According to MPEP §2131, “a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. Of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the ...claims.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913 (Fed. Cir. 1989). The elements must be arranged as required by the claims, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicants respectfully submit that the Office Action has failed to establish the required *prima facie* case of anticipation because the cited reference, *Syverson*, fails to teach or suggest each and every feature as set forth in the claimed invention.

Applicants respectfully submit that independent claim 19 likewise defines over the teachings of *Syverson* based on similar reasoning to that set forth above. Furthermore, Applicants submit that dependent claims 2-11 and 20-23 define over *Syverson* at least based on their dependency from an allowable base claim, as well as on their own merits. With specific reference to claim 5, Applicants fail to find the arrangement of a freewheeling diode as claimed in the arrangement of *Syverson*. Furthermore, with reference to dependent claim 11, Applicants fail to find any teaching in *Syverson* that the RC circuit is used to selectively and temporarily absorb excitation current in a free-wheeling path when

a field current modulator is in an OFF state to reduce voltage overshoot in the power generator upon occurrence of an operating transition.

At least for the above reasons, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 102.

2. § 103 Rejection: Syverson - Knowledge in the Art

Claims 12-18 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over *Syverson* in view of common knowledge in the art. This rejection is respectfully traversed.

Independent claim 12 is directed to a method of controlling a power generator. The method of claim 12 comprises: repeatedly switching a field current modulator between an ON state and an OFF state to control a flow of field current to the power generator; feeding excitation current, via a free-wheeling path, back to the power generator as a field current component when the field current modulator is in the OFF state; and selectively and temporarily absorbing excitation current in the free-wheeling path, using an impedance circuit, to reduce voltage overshoot of the power generator upon occurrence of an operating transition.

In rejecting claim 12, the Examiner relies on the construction of the hybrid alternator of *Syverson*, described in connection with the rejection of claim 1, and asserts that a method of controlling such a power generator would have been obvious to one of ordinary skill in the art. As should be readily apparent from the above discussion of *Syverson*, however, the voltage regulation technique of *Syverson* is distinct from the power generator control method recited in independent claim 12.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection of claims 12-18 under 35 U.S.C. § 103.

New Claims

Newly-added claims 24-29 are each dependent claims, which define over the asserted prior art at least for reasons set forth above, as well as on their own merits.

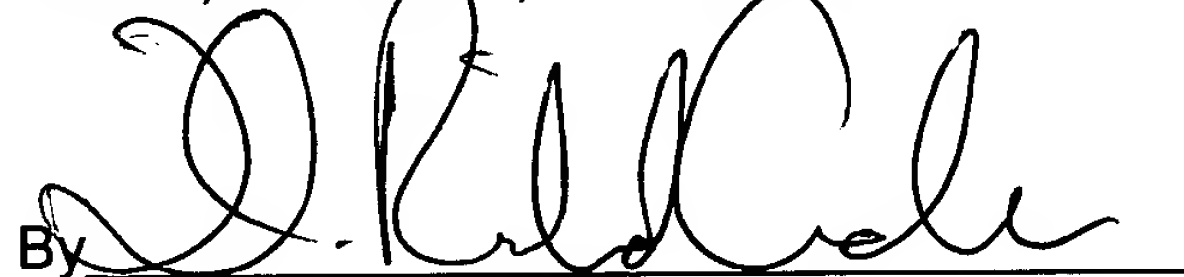
CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version With Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

Please replace the title with the following new title:

--[GENERATOR] LOAD-OFF TRANSIENT ACCELERATION GENERATOR
CONTROL APPARATUS/METHOD--

IN THE CLAIMS:

New claims 24-29 have been added.